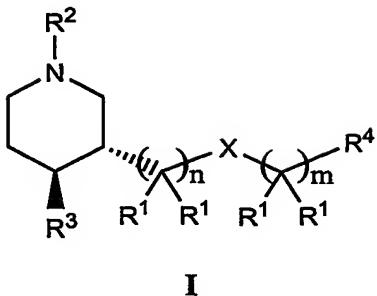


We claim:

1. A compound represented by formula I:



5 wherein

R^1 represents independently for each occurrence H or alkyl;

R^2 is H, alkyl, aryl, aralkyl, or $-C(O)R^5$;

R^3 is aryl, heteroaryl, or aralkyl;

10 R^4 is hydrogen, hydroxyl, aryl, heteroaryl, OR^5 , CO_2R^6 , $C(O)N(R^6)_2$, $C(O)NHOH$, $OC(O)R^5$, or oxadiazole;

R^5 is alkyl, aryl, heteroaryl, or aralkyl;

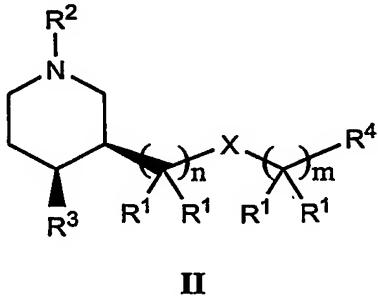
R^6 represents independently for each occurrence hydrogen, alkyl, aryl, or aralkyl, wherein any two instances of R^6 may be covalently attached to form a ring;

X is S, $-S(O)-$, or $-S(O_2)-$;

15 n is 1, 2, 3, or 4; and

m is 1, 2, 3, or 4.

2. A compound represented by formula II:



wherein

R^1 represents independently for each occurrence H or alkyl;

R^2 is H, alkyl, aryl, aralkyl, or $-C(O)R^5$;

R^3 is aryl, heteroaryl, or aralkyl;

5 R^4 is hydrogen, hydroxyl, aryl, heteroaryl, OR^5 , CO_2R^6 , $C(O)N(R^6)_2$, $C(O)NHOH$, $OC(O)R^5$, or oxadiazole;

R^5 is alkyl, aryl, heteroaryl, or aralkyl;

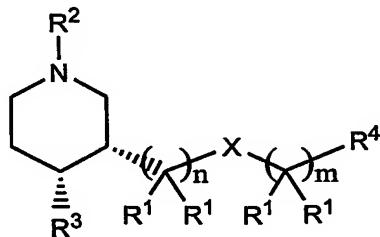
R^6 represents independently for each occurrence hydrogen, alkyl, aryl, or aralkyl, wherein any two instances of R^6 may be covalently attached to form a ring;

10 X is S, $-S(O)-$, or $-S(O_2)-$;

n is 1, 2, 3, or 4; and

m is 1, 2, 3, or 4.

3. A compound represented by formula III:



15

wherein

R^1 represents independently for each occurrence H or alkyl;

R^2 is H, alkyl, aryl, aralkyl, or $-C(O)R^5$;

R^3 is aryl, heteroaryl, or aralkyl;

20 R^4 is hydrogen, hydroxyl, aryl, heteroaryl, OR^5 , CO_2R^6 , $C(O)N(R^6)_2$, $C(O)NHOH$, $OC(O)R^5$, or oxadiazole;

R^5 is alkyl, aryl, heteroaryl, or aralkyl;

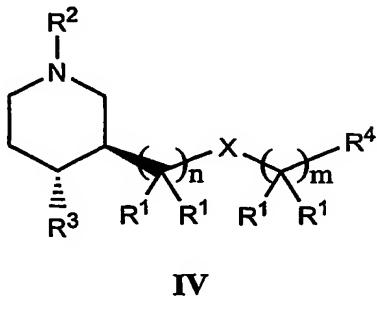
R^6 represents independently for each occurrence hydrogen, alkyl, aryl, or aralkyl, wherein any two instances of R^6 may be covalently attached to form a ring;

X is S, -S(O)-, or -S(O₂)-;

n is 1, 2, 3, or 4; and

m is 1, 2, 3, or 4.

5. A compound represented by formula IV:



wherein

10 R^1 represents independently for each occurrence H or alkyl;

R^2 is H, alkyl, aryl, aralkyl, or -C(O)R⁵;

R^3 is aryl, heteroaryl, or aralkyl;

R^4 is hydrogen, hydroxyl, aryl, heteroaryl, OR⁵, CO₂R⁶, C(O)N(R⁶)₂, C(O)NHOH, OC(O)R⁵, or oxadiazole;

15 R^5 is alkyl, aryl, heteroaryl, or aralkyl;

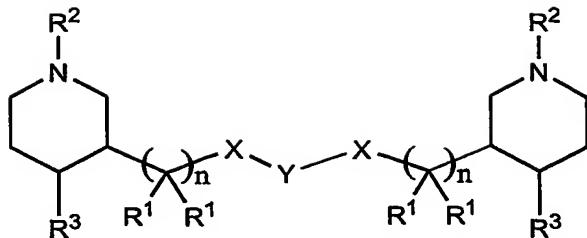
R^6 represents independently for each occurrence hydrogen, alkyl, aryl, or aralkyl, wherein any two instances of R^6 may be covalently attached to form a ring;

X is S, -S(O)-, or -S(O₂)-;

n is 1, 2, 3, or 4; and

20 m is 1, 2, 3, or 4.

5. A compound represented by formula V:



V

wherein

R¹ represents independently for each occurrence H or alkyl;

5 R² is H, alkyl, aryl, aralkyl, or -C(O)R⁴;

R³ is aryl, heteroaryl, or aralkyl;

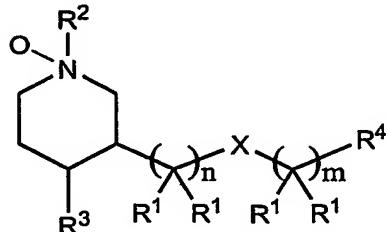
R⁴ is alkyl, aryl, heteroaryl, or aralkyl;

X is S, -S(O)-, or -S(O₂)-;

n represents independently for each occurrence 1, 2, 3, or 4; and

10 Y is alkyl.

6. A compound represented by formula VI:



VI

wherein

15 R¹ represents independently for each occurrence H or alkyl;

R² is H, alkyl, aryl, aralkyl, or -C(O)R⁵;

R³ is aryl, heteroaryl, or aralkyl;

R⁴ is hydrogen, hydroxyl, aryl, heteroaryl, OR⁵, CO₂R⁶, C(O)N(R⁶)₂, C(O)NHOH, OC(O)R⁵, or oxadiazole;

R⁵ is alkyl, aryl, heteroaryl, or aralkyl;

R⁶ represents independently for each occurrence hydrogen, alkyl, aryl, or aralkyl, wherein any two instances of R⁶ may be covalently attached to form a ring;

X is S, -S(O)-, or -S(O₂)-;

5 n is 1, 2, 3, or 4; and

m is 1, 2, 3, or 4.

7. The compound of claim 1, 2, 3, 4, 5, or 6, wherein X is S or -S(O)-.
8. The compound of claim 1, 2, 3, 4, 5, or 6, wherein R² is methyl, ethyl or propyl.
9. The compound of claim 1, 2, 3, 4, 5, or 6, wherein R² is methyl.
10. 10. The compound of claim 1, 2, 3, 4, 5, or 6, wherein R³ is optionally substituted phenyl.
11. The compound of claim 1, 2, 3, 4, 5, or 6, wherein R³ is halophenyl.
12. The compound of claim 1, 2, 3, 4, 5, or 6, wherein R³ is 3-chlorophenyl.
13. The compound of claim 1, 2, 3, 4, 5, or 6, wherein R⁴ is C(O)N(R⁶)₂.
14. 14. The compound of claim 1, 2, 3, 4, 5, or 6, wherein R⁴ is C(O)N(R⁶)₂ and R⁶ represents independently for each occurrence hydrogen or alkyl.
15. 15. The compound of claim 1, 2, 3, 4, 5, or 6, wherein X is S, n is 1, m is 1, R¹ is hydrogen, R² is methyl, and R³ is 3-chlorophenyl.
16. The compound of claim 1, 2, 3, 4, 5, or 6, wherein X is S, n is 1, m is 1, R¹ is hydrogen, R² is methyl, R³ is 3-chlorophenyl, and R⁴ is C(O)N(R⁶)₂.
20. 17. The compound of claim 1, 2, 3, 4, 5, or 6, wherein X is S, n is 1, m is 1, R¹ is hydrogen, R² is methyl, R³ is 3-chlorophenyl, and R⁴ is C(O)N(H)iPr.
18. The compound of claim 1, 2, 3, 4, 5, or 6, wherein X is S, n is 1, m is 1, R¹ is hydrogen, R² is methyl, R³ is 3-chlorophenyl, and R⁴ is C(O)N(H)CH₃.
19. The compound of claim 1, 2, 3, 4, 5, or 6, wherein X is -S(O)-, n is 1, R¹ is hydrogen, R² is methyl, and R³ is 3-chlorophenyl.
- 25.

20. The compound of claim 1, 2, 3, 4, 5, or 6, wherein X is -S(O)-, n is 1, m is 2, R¹ is hydrogen, R² is methyl, R³ is 3-chlorophenyl, and R⁴ is OC(O)R⁵.

21. The compound of claim 1, 2, 3, 4, 5, or 6, wherein X is -S(O)-, n is 1, m is 2, R¹ is hydrogen, R² is methyl, R³ is 3-chlorophenyl, R⁴ is OC(O)R⁵, and R⁵ is CH₃.

5 22. The compound of claim 1, 2, 3, 4, 5, or 6, wherein X is -S(O)-, n is 1, m is 2, R¹ is hydrogen, R² is methyl, R³ is 3-chlorophenyl, R⁴ is OC(O)R⁵, and R⁵ is phenyl.

23. The compound of claim 1, 2, 3, 4, 5, or 6, wherein X is -S(O)-, n is 1, m is 1, R¹ is hydrogen, R² is methyl, R³ is 3-chlorophenyl, and R⁴ is C(O)NHOH.

24. The compound of claim 2, wherein X is S or -S(O)-.

10 25. The compound of claim 2, wherein R² is methyl, ethyl or propyl.

26. The compound of claim 2, wherein R² is methyl.

27. The compound of claim 2, wherein R³ is optionally substituted phenyl.

28. The compound of claim 2, wherein R³ is halophenyl.

29. The compound of claim 2, wherein R³ is 3-chlorophenyl.

15 30. The compound of claim 2, wherein R⁴ is C(O)N(R⁶)₂.

31. The compound of claim 2, wherein R⁴ is C(O)N(R⁶)₂ and R⁶ represents independently for each occurrence hydrogen or alkyl.

32. The compound of claim 2, wherein X is S, n is 1, m is 1, R¹ is hydrogen, R² is methyl, and R³ is 3-chlorophenyl.

20 33. The compound of claim 2, wherein X is S, n is 1, m is 1, R¹ is hydrogen, R² is methyl, R³ is 3-chlorophenyl, and R⁴ is C(O)N(R⁶)₂.

34. The compound of claim 2, wherein X is S, n is 1, m is 1, R¹ is hydrogen, R² is methyl, R³ is 3-chlorophenyl, and R⁴ is C(O)N(H)iPr.

35. The compound of claim 3, wherein X is S or -S(O)-.

25 36. The compound of claim 3, wherein R² is methyl, ethyl or propyl.

37. The compound of claim 3, wherein R² is methyl.

38. The compound of claim 3, wherein R³ is optionally substituted phenyl.
39. The compound of claim 3, wherein R³ is halophenyl.
40. The compound of claim 3, wherein R³ is 3-chlorophenyl.
41. The compound of claim 3, wherein R⁴ is C(O)N(R⁶)₂.
- 5 42. The compound of claim 3, wherein R⁴ is C(O)N(R⁶)₂ and R⁶ represents independently for each occurrence hydrogen or alkyl.
43. The compound of claim 3, wherein X is S, n is 1, m is 1, R¹ is hydrogen, R² is methyl, and R³ is 3-chlorophenyl.
- 10 44. The compound of claim 3, wherein X is S, n is 1, m is 1, R¹ is hydrogen, R² is methyl, R³ is 3-chlorophenyl, and R⁴ is C(O)N(R⁶)₂.
45. The compound of claim 3, wherein X is S, n is 1, m is 1, R¹ is hydrogen, R² is methyl, R³ is 3-chlorophenyl, and R⁴ is C(O)N(H)iPr.
46. The compound of claim 4, wherein X is S or -S(O)-.
47. The compound of claim 4, wherein R² is methyl, ethyl or propyl.
- 15 48. The compound of claim 4, wherein R² is methyl.
49. The compound of claim 4, wherein R³ is optionally substituted phenyl.
50. The compound of claim 4, wherein R³ is halophenyl.
51. The compound of claim 4, wherein R³ is 3-chlorophenyl.
52. The compound of claim 4, wherein R⁴ is C(O)N(R⁶)₂.
- 20 53. The compound of claim 4, wherein R⁴ is C(O)N(R⁶)₂ and R⁶ represents independently for each occurrence hydrogen or alkyl.
54. The compound of claim 4, wherein X is S, n is 1, m is 1, R¹ is hydrogen, R² is methyl, and R³ is 3-chlorophenyl.
- 25 55. The compound of claim 4, wherein X is S, n is 1, m is 1, R¹ is hydrogen, R² is methyl, R³ is 3-chlorophenyl, and R⁴ is C(O)N(R⁶)₂.

56. The compound of claim 4, wherein X is S, n is 1, m is 1, R¹ is hydrogen, R² is methyl, R³ is 3-chlorophenyl, and R⁴ is C(O)N(H)iPr.

57. The compound of claim 5, wherein X is S or -S(O)-.

58. The compound of claim 5, wherein R² is methyl.

5 59. The compound of claim 5, wherein R³ is optionally substituted phenyl.

60. The compound of claim 5, wherein R³ is 3-chlorophenyl.

61. The compound of claim 6, wherein X is S or -S(O)-.

62. The compound of claim 6, wherein R² is methyl, ethyl or propyl.

63. The compound of claim 6, wherein R² is methyl.

10 64. The compound of claim 6, wherein R³ is optionally substituted phenyl.

65. The compound of claim 6, wherein R³ is halophenyl.

66. The compound of claim 6, wherein R³ is 3-chlorophenyl.

67. The compound of claim 6, wherein R⁴ is C(O)N(R⁶)₂.

15 68. The compound of claim 6, wherein R⁴ is C(O)N(R⁶)₂ and R⁶ represents independently for each occurrence hydrogen or alkyl.

69. The compound of claim 6, wherein X is S, n is 1, m is 1, R¹ is hydrogen, R² is methyl, and R³ is 3-chlorophenyl.

70. The compound of claim 6, wherein X is S, n is 1, m is 1, R¹ is hydrogen, R² is methyl, R³ is 3-chlorophenyl, and R⁴ is C(O)N(R⁶)₂.

20 71. The compound of claim 6, wherein X is S, n is 1, m is 1, R¹ is hydrogen, R² is methyl, R³ is 3-chlorophenyl, and R⁴ is C(O)N(H)iPr.

72. The compound of claim 1, 2, 3, 4, 5, or 6, wherein said compound has an EC₅₀ less than 1 μM in an assay based on a mammalian dopamine, serotonin, or norepinephrine receptor or transporter.

73. The compound of claim 1, 2, 3, 4, 5, or 6, wherein said compound has an EC₅₀ less than 10 nM in an assay based on a mammalian dopamine, serotonin, or norepinephrine receptor or transporter.

74. The compound of claim 1, 2, 3, 4, 5, or 6, wherein said compound has an EC₅₀ less than 5 100 nM in an assay based on a mammalian dopamine, serotonin, or norepinephrine receptor or transporter.

75. The compound of claim 1, 2, 3, 4, 5, or 6, wherein said compound has an IC₅₀ less than 1 μ M in an assay based on a mammalian dopamine, serotonin, or norepinephrine receptor or transporter.

10 76. The compound of claim 1, 2, 3, 4, 5, or 6, wherein said compound has an IC₅₀ less than 10 nM in an assay based on a mammalian dopamine, serotonin, or norepinephrine receptor or transporter.

15 77. The compound of claim 1, 2, 3, 4, 5, or 6, wherein said compound has an IC₅₀ less than 100 nM in an assay based on a mammalian dopamine, serotonin, or norepinephrine receptor or transporter.

78. A method of modulating the activity of a dopamine, serotonin, or norepinephrine receptor or transporter in a mammal, comprising the step of administering to said mammal a therapeutically effective amount of a compound of claim 1, 2, 3, 4, 5, or 6.

79. The method of claim 78, wherein said mammal is a primate, equine, canine or feline.

20 80. The method of claim 78, wherein said mammal is a human.

81. The method of claim 78, wherein said compound is administered orally.

82. The method of claim 78, wherein said compound is administered intravenously.

83. The method of claim 78, wherein said compound is administered sublingually.

84. The method of claim 78, wherein said compound is administered ocularly.

25 85. The method of claim 78, wherein said compound is administered transdermally.

86. The method of claim 78, wherein said compound is administered rectally.

87. The method of claim 78, wherein said compound is administered vaginally.

88. The method of claim 78, wherein said compound is administered topically.
89. The method of claim 78, wherein said compound is administered intramuscularly.
90. The method of claim 78, wherein said compound is administered subcutaneously.
91. The method of claim 78, wherein said compound is administered buccally.
- 5 92. The method of claim 78, wherein said compound is administered nasally.
93. A method of treating a mammal suffering from addiction, anxiety, depression, sexual dysfunction, hypertension, migraine, Alzheimer's disease, obesity, emesis, psychosis, analgesia, schizophrenia, Parkinson's disease, restless leg syndrome, sleeping disorders, attention deficit hyperactivity disorder, irritable bowel syndrome, premature ejaculation, menstrual dysphoria syndrome, urinary incontinence, inflammatory pain, neuropathic pain, Lesche-Nyhane disease, Wilson's disease, or Tourette's syndrome, comprising the step of administering to said mammal a therapeutically effective amount of a compound of claim 1, 2, 3, 4, 5, or 6.
- 10 94. The method of claim 93, wherein said mammal is a primate, equine, canine or feline.
95. The method of claim 93, wherein said mammal is a human.
- 15 96. The method of claim 93, wherein said compound is administered orally.
97. The method of claim 93, wherein said compound is administered intravenously.
98. The method of claim 93, wherein said compound is administered sublingually.
99. The method of claim 93, wherein said compound is administered ocularly.
100. The method of claim 93, wherein said compound is administered transdermally.
- 20 101. The method of claim 93, wherein said compound is administered rectally.
102. The method of claim 93, wherein said compound is administered vaginally.
103. The method of claim 93, wherein said compound is administered topically.
104. The method of claim 93, wherein said compound is administered intramuscularly.
105. The method of claim 93, wherein said compound is administered subcutaneously.
- 25 106. The method of claim 93, wherein said compound is administered buccally.
107. The method of claim 93, wherein said compound is administered nasally.